

ALGEBRAIC EXPRESSIONS:

1. Identify the property illustrated by the following: $-5 + [0 + (-2)] = -5 + (-2)$
2. Simplify: $-3^2(2) - 12 + 2^3$
3. List the elements of the set $\{-\sqrt{11}, -7, -\frac{4}{5}, \sqrt{9}, \frac{12}{2}\}$ that are whole numbers.
4. When written without absolute value bars $|20 - x^2|$ if $-4 \leq x \leq 4$ is equal to:

POLYNOMIALS:

1. $(8a^3 + 9a^2 - 5p) - (4a^3 - 12a^2 + 9)$ equals:
2. The coefficient of x^2 in the product $(4x^2 - 2x)(-5x^2 + 7x + 1)$ is:
3. Expand: $(5x^a + 1)^2$
4. Find the second term of the quotient when $20x^3y^4 + 3x^3y^2 - xy^2 - 14y - 12$ is divided by $2y + 5$
5. Add: $\frac{2ax}{y} + \frac{r}{3s}$
6. Multiply: $\frac{a+b}{2a^2-2ab} \cdot \frac{4a^2-6ab+2b^2}{a^2+2ab+b^2}$
7. The expression: $\frac{\frac{x+1}{x^2-x-6}}{\frac{3}{x-3}}$ equals:
8. Factor: $x^2 - y^2 + x^2 - 2xy + y^2$

9. Factor: $64a^3 + 27b^6$?

10. Expand: $(x - 3y - z)^2$

EXPONENTS AND RADICALS:

1. Simplify: $\frac{8a^{\frac{1}{5}}b^{\frac{3}{4}}c^{-6}}{2b^{\frac{1}{3}}c^{-2}}$

2. Evaluate: $\left(\frac{16}{81}\right)^{\frac{3}{4}}$

3. Reduce: $\sqrt[6]{27}$

4. Subtract: $5\sqrt{27} - 2\sqrt{12}$

5. Multiply: $(5 + \sqrt[3]{3})(7 - \sqrt[3]{3})$

6. Simplify: $\frac{5}{\sqrt{2} - \sqrt{7}}$

7. Rationalize: $\sqrt[4]{\frac{2}{27}}$

COMPLEX NUMBERS:

1. $(7 - 8i) - (1 - 13i)$ equals:

2. Multiply: $\sqrt{-5} \cdot \sqrt{-12}$

3. $(3 + 2i)(3 - 7i)$ equals:

4. The conjugate of $5 - i$ is:

5. i^{351} in simplest form is:

BINOMIAL THEOREM/COUNTING THEORY:

1. $28a^6b^2$ is a term of a binomial expansion of $(a + b)^8$, which one?
2. Which row of Pascal's triangle could be used to expand $(3x^2 - 7y^3)^5$?
3. Find the value of $P(10,5)$.
4. There are 13 girls in a third grade class. In how many ways can the teacher select a group of 4 girls to participate in a special project?

SOLVING EQUATIONS:

1. Solve $3(1 - 2z) - 3 = -9(1 + 2z) + 3z$ for z .
2. The solution to the equation $\frac{5}{x+3} - \frac{1}{x-2} = \frac{-6}{x+3}$ is:
3. Solve $a = \frac{3a}{1-r} - 5$ for r .
4. The perimeter of a rectangle is 38 meters. The length is 1 meter less than 3 times the width. Find the width of the rectangle.
5. Two trains leave the same point at the same time traveling in the opposite directions. One travels 5 mph faster than the other. After 5 hours they are 375 miles apart. What is the speed of the faster train?
6. Solve the equation $|5a - 2| = |4a + 8|$.
7. Solve $2x(x - 5) = 2x - 9$ for x .
8. What kind of solutions does $(4x - 2)^2 = 9$ have?

9. The discriminant for the equation $2x^2 + 5x = -4$ is:

10. Solve $\sqrt{2x} - 1 = \sqrt{2x - 7}$

11. Use the process of completing the square to solve the equation $3x^2 + 12x = 9$.

12. Solve: $x^3 + 3x^2 - 4x - 12 = 0$

13. Find the real solutions for: $\sqrt[3]{11x + 4} = -5$

14. Jon can take 50 orders in 3 hours, and Josh can take 50 orders in 5 hours. How long will it take both Jon and Josh, working together, to take 100 orders?

15. Suppose y varies directly as t and inversely as z . If $y = 8$ when $t = 12$ and $z = 6$, find y when $t = 20$ and $z = 4$.

16. a varies jointly with c and d and inversely with the square of p . What is the result on a if c is halved, d is tripled, and p is doubled?